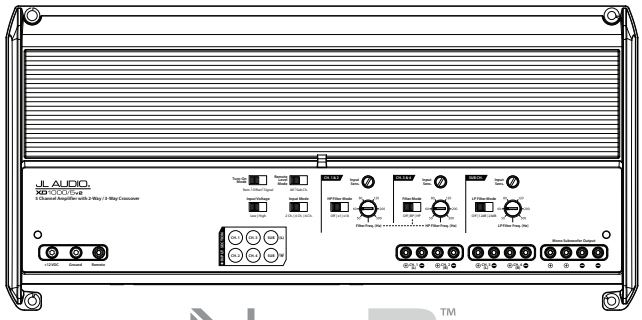
OWNER'S MANUAL

XD1000/5v2

1000W 5-Channel Amplifier with 2-Way / 3-Way Crossover



NexD™
SWITCHING TECHNOLOGY

Thank you for purchasing a JL Audio amplifier for your automotive sound system.

Your amplifier has been designed and manufactured to exacting standards in order to ensure years of musical enjoyment in your vehicle. For maximum performance, we highly recommend that you have your new amplifier installed by an authorized JL Audio dealer. Your authorized dealer has the training, expertise and installation equipment to ensure optimum performance from this product. Should you decide to install the amplifier yourself, please take the time to read this manual thoroughly so as to familiarize yourself with its installation requirements and setup procedures.

If you have any questions regarding the instructions in this manual or any aspect of your amplifier's operation, please contact your authorized JL Audio dealer for assistance. If you need further assistance, please call the JL Audio Technical Support Department at (954) 443-1100 during business hours.

JL AUDIO®

PROTECT YOUR HEARING!

We value you as a long-term customer. For that reason, we urge you to practice restraint in the operation of this product so as not to damage your hearing and that of others in your vehicle. Studies have shown that continuous exposure to high sound pressure levels can lead to permanent (irreparable) hearing loss. This and all other high-power amplifiers are capable of producing such high sound pressure levels when connected to a speaker system. Please limit your continuous exposure to high volume levels.

While driving, operate your audio system in a manner that still allows you to hear necessary noises to operate your vehicle safely (horns, sirens, etc.).

SERIAL NUMBER

In the event that your amplifier requires service or is ever stolen, you will need to have a record of the product's serial number. Please take the time to enter that number in the space provided below. The serial number can be found on the bottom panel of the amplifier and on the amplifier packaging.

Serial Number:

_____

INSTALLATION APPLICATIONS

This amplifier is designed for operation in vehicles with 12 volt, negative-ground electrical systems. Use of this product in vehicles with positive ground and/or voltages other than 12V may result in damage to the product and will void the warranty.

This product is not certified or approved for use in aircraft.

Do not attempt to "bridge" the outputs of this amplifier with the outputs of a second amplifier, including an identical one.

PLANNING YOUR INSTALLATION

It is important that you take the time to read this manual and that you plan out your installation carefully. The following are some considerations that you must take into account when planning your installation.

Cooling Efficiency Considerations:

The outer shell of your JL Audio amplifier is designed to remove heat from the amplifier circuitry. For optimum cooling performance, this outer shell should be exposed to as large a volume of air as possible. Enclosing the amplifier in a small, poorly ventilated chamber can lead to excessive heat build-up and degraded performance. If an installation calls for an enclosure around the amplifier, we recommend that this enclosure be ventilated with the aid of a fan. In normal applications, fan-cooling is not necessary.

! IMPORTANT

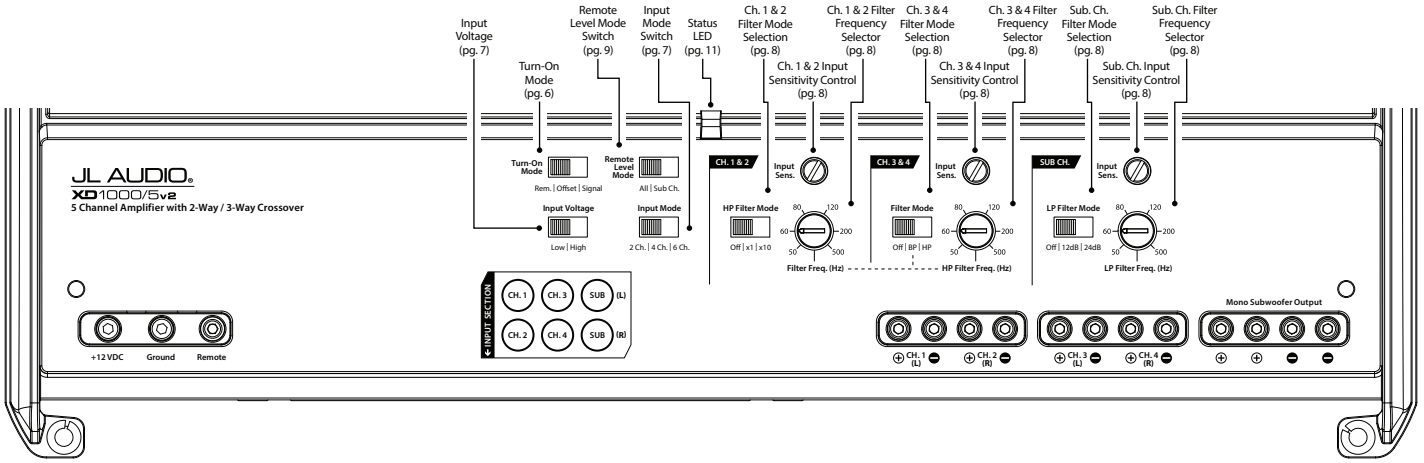
Mounting the amplifier upside down is strongly discouraged. If mounting the amplifier under a seat, make sure there is at least 1 inch (2.5 cm) of space above the amplifier's outer shell to permit proper cooling.

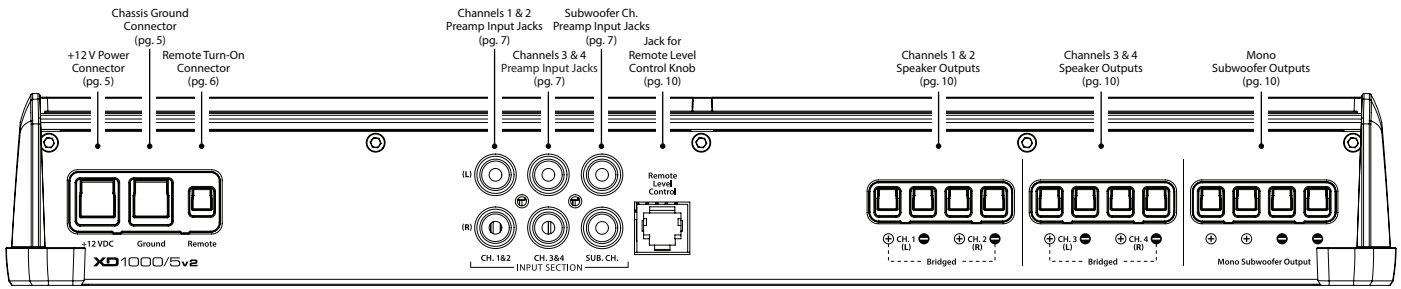
Safety Considerations:

Your amplifier needs to be installed in a dry, well-ventilated environment and in a manner which does not interfere with your vehicle's safety equipment (air bags, seat belt systems, ABS brake systems, etc.). You should also take the time to securely mount the amplifier so that it does not come loose in the event of a collision or a sudden jolt to the vehicle.

Stupid Mistakes to Avoid

- Check before drilling any holes in your vehicle to make sure that you will not be drilling through a gas tank, brake line, wiring harness or other vital vehicle system.
- Do not run system wiring outside or underneath the vehicle. This is an extremely dangerous practice which can result in severe damage to your vehicle and person.
- Protect all system wires from sharp metal edges and wear by carefully routing them, tying them down and using grommets and loom where appropriate.
- Do not mount the amplifier in the engine compartment, under the vehicle, on the roof or in any other area that will expose the amplifier circuitry to the elements.





PRODUCT DESCRIPTION

The JL Audio XD1000/5v2 is a five-channel, system amplifier utilizing JL Audio NexD™ ultra-high speed switching technology for its four main channels and NexD™ high-speed switching for its subwoofer channel. The NexD™ technologies deliver outstanding fidelity and efficiency.

The XD1000/5v2 can be operated with a wide variety of source units and system configurations.

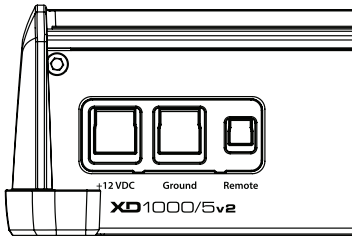
TYPICAL INSTALLATION SEQUENCE

The following represents the sequence for a typical amplifier installation, using an aftermarket source unit or OEM Interface processor (like the CleanSweep CL441dsp). Additional steps and different procedures may be required in some applications. If you have any questions, please contact your authorized JL Audio dealer for assistance.

1) Disconnect the negative battery post connection and secure the disconnected cable to prevent accidental re-connection during installation. **This step is not optional.**
2) Run 4 AWG power wire from the battery location to the amplifier mounting location. Take care to route the wire in such a way that it will not be damaged and will not interfere with vehicle operation. Use 2 AWG or larger power wire and a power distribution block if additional amplifiers are being installed with the XD1000/5v2.
3) Connect power wire to the positive battery post. Fuse the wire with an appropriate fuse block (and connectors) within 18 inches (45 cm) wire length of the positive battery post. **This fuse is essential to protect the vehicle. Do not install the fuse until the power wire has been securely connected to the amplifier.**
4) Run signal cables and remote turn-on wire from the source unit to the final amplifier mounting location.
5) Run speaker cables from the speaker systems to the amplifier mounting location.
6) Find a good, solid metal grounding point close to the amplifier and connect the negative power wire to it using appropriate hardware (use of the JL Audio ECS master ground lug, XB-MGLU is recommended). Use 4 AWG wire, no longer than 36 inches (90 cm) from the amplifier to the ground connection point. In some vehicles, it may be necessary to upgrade the battery ground wire. (See page 5 for important notice).
7) Securely mount the amplifier.
8) Connect the positive and negative power wires to the amplifier. A fuse near the amplifier is not necessary if the XD1000/5v2 is the only device being run from the fused main power wire. If the fused main power wire is shared by the XD1000/5v2 and other amplifiers or devices, fuse each amplifier/device within 12 inches (30 cm) of wire length, via a fused distribution block or multiple individual fuse blocks/on-board fuses.
9) Connect the remote turn-on wire to the amplifier.
10) Connect the input cables to the amplifier.
11) Connect the speaker cables to the amplifier.
12) Carefully review the amplifier's control settings to make sure that they are set according to the needs of the system.
13) Install the power wire fuse(s) (80A for a single XD1000/5v2) and reconnect the negative battery post terminal.
14) Turn on the source unit at a low level to double-check that the amplifier is configured correctly. Resist the temptation to crank it up until you have verified the control settings.
15) Make necessary adjustments to the input sensitivity controls to obtain the right overall output and the desired balance in the system. See Appendix A (page 14) for the recommended input sensitivity setting method.
16) Enjoy the fruits of your labor with your favorite music.

POWER CONNECTIONS

Before installing the amplifier, disconnect the negative (ground) wire from the vehicle's battery. This will prevent accidental damage to the system, the vehicle and your body during installation.



The XD1000/5v2's "**+12 VDC**" and "**Ground**" connections are designed to accept 4 AWG power wire. **4 AWG is the required wire size for this amplifier.**

If you are installing the XD1000/5v2 with other amplifiers and wish to use a single main power wire, use 2 AWG or 1/0 AWG main power wire (depending on the overall current demands of all the amplifiers in the system). This large power wire should terminate into a fused distribution block mounted as close to the amplifiers as possible (within 12 inches / 30cm of wire length). The fused output of the distribution block will connect to the XD1000/5v2 with 4 AWG power wire. JL Audio ECS fused distribution blocks are recommended (XD-FDBU-2 and XD-FDBU-4)

Note: Smaller AWG numbers mean bigger wire and vice-versa (1/0 AWG is the largest, 2 AWG is smaller, then 4 AWG, then 8 AWG, etc.).

To connect the power wires to the amplifier, first back out the set screw on the top of the terminal block, using the supplied 2.5 mm hex wrench. Strip 1/2 inch (12 mm) of insulation from the end of each wire and insert the bare wire into the terminal block, seating it firmly so that no bare wire is exposed. While holding the wire in place, tighten the set screw firmly, taking care not to strip the head of the screw.

The ground connection should be made using 4 AWG wire and should be kept as short as possible, while accessing a solid piece of sheet metal in the vehicle. The surface of the sheet metal should be sanded at the contact point to create a clean, metal-to-metal connection between the chassis and the termination of the ground wire. For optimal grounding, we recommend the use of a JL Audio ECS master ground lug (XB-MGLU). Alternatively, a sheet metal screw or bolt can be used with a star washer.

Any wires run through metal barriers (such as firewalls), must be protected with a high quality rubber grommet to prevent damage to the insulation of the wire. Failure to do so may result in a dangerous short circuit.

! IMPORTANT

Many vehicles employ small (10 AWG - 6 AWG) wire to ground the battery to the vehicle chassis and to connect the alternator's positive connection to the battery. To prevent voltage drops, these wires should be upgraded to 4 AWG when installing amplifier systems with main fuse ratings above 60A.

FUSE REQUIREMENTS

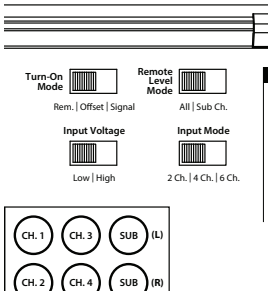
It is absolutely vital that the main power wire(s) to the amplifier(s) in the system be fused within 18 inches (45 cm) of the positive battery post connection. The fuse value at each power wire should be high enough for all of the equipment being run from that power wire. If only the XD1000/5v2 is being run from that power wire, we recommend a 80A fuse be used.

If fusing the amplifier near its power connections (when more than one amp is being run from the main power wire), use a 80A fuse. MAXI™ plastic-body fuses are recommended.

TURN-ON OPTIONS

The XD1000/5v2 can be switched on and off using one of three methods, determined by the position of the amplifier's **"Turn-On Mode"** switch. Please read these options and decide which is best suited for your specific system.

1) +12V remote turn-on lead
2) Signal-sensing turn-on circuit.
3) DC offset-sensing turn-on circuit



+12 V Remote Turn-On: This is the preferred method for turning the amplifier on/off. The amplifier will turn on when +12 V is present at its "**Remote**" input and turn off when +12 V is switched off. This +12V remote turn-on signal is typically controlled by a source unit's remote turn-on wire. The XD1000/5v2's "**Remote**" turn-on connector will accept 18 AWG – 12 AWG wire. To connect the remote turn-on wire to the amplifier, first back out the set screw on the top of the terminal block, using the supplied 2.5 mm hex wrench. Strip 1/2 inch (12mm) of wire and insert the bare wire into the terminal block, seating it firmly so that no bare wire is exposed. While holding the wire in the terminal, tighten the set screw firmly, taking care not to strip the head of the screw and making sure that the wire is firmly gripped by the set screw.

If a source unit does not have a dedicated remote turn-on output, consider one of the following alternative turn-on options:

These methods are useful when a conventional +12 V remote turn-on signal is not available in a system. These allow you to operate the amplifier without having to locate a remote turn-on lead at the source unit, which can be very useful when interfacing the amplifier with OEM (factory) audio systems that do not use conventional +12 V turn-on leads.

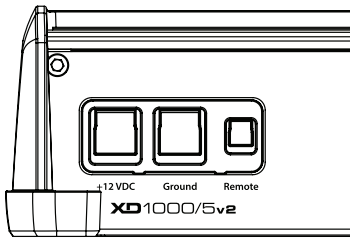
Depending on the characteristics of the audio signal, one of the following methods may work better than the other. We recommend trying DC Offset-Sensing first as it does not require a long delay to turn the system off after the signal is shut off.

DC Offset-Sensing: The amplifier will turn on and off by detecting the presence of a very small DC signal (offset) that is typical in the audio output of most OEM (factory) source units and amplifiers. The amplifier will turn on and off in reaction to the presence or absence of this DC Offset. The sensitivity of this circuit is designed for high-level (speaker level) signals, not for low-level (preamp level) signals. The circuit senses the "Ch. 1" (left) input signal only.

Signal-Sensing: The amplifier will turn on and off by detecting the presence of a full-range audio signal at its "Ch 1" (left) input. After several minutes of no signal, the amplifier will shut off. The sensitivity of this circuit is designed for high-level (speaker level) signals, not for low-level (preamp level) signals. The circuit is tuned to react to signals at mid-range frequencies. This prevents false switching from signals created by moving loudspeakers that are in parallel with the amplifier's input signal.

! IMPORTANT

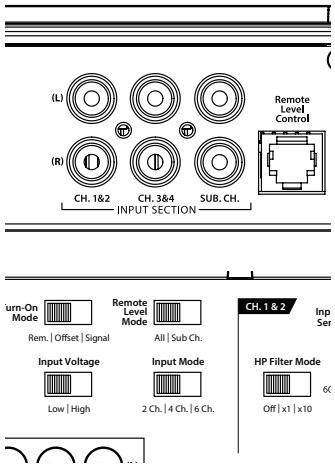
In signal and DC sensing applications, the amplifier's **"Remote"** turn-on terminal becomes a remote turn-on output. This allows the XD1000/5v2 to turn on other amplifiers in the audio system that do not have signal sensing.



INPUT SECTION

The XD1000/5v2's input section allows you to send signals to the amplifier section through the use of two, four or six differential-balanced inputs.

Input connections are via up to three pairs of traditional RCA-type jacks.



If you wish to send six discrete channels into the XD1000/5v2, simply use all six inputs and set the "**Input Mode**" switch in the "**6 Ch.**" position. The amplifier will automatically combine the left and right "**Sub Ch.**" input signals to mono. If you have only one channel of subwoofer signal available, it is acceptable to only use one of the **"Sub Ch."** inputs, but for optimal gain, we recommend using a Y-adaptor and feeding both **"Sub Ch." i**nputs.

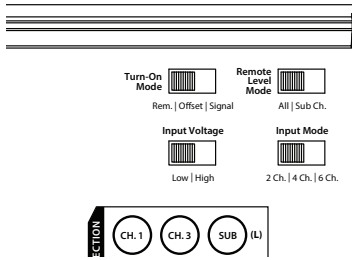
If you prefer to use only four channels of input into the XD1000/5v2, set the "**Input Mode**" switch in the "**4 Ch.**" position and use the Ch 1 & 2 and Ch 3 & 4 Inputs. In this mode, the XD1000/5v2 will derive its subwoofer channel signal from a sum of all four input signals. The bass will not fade when the signal is faded by the head unit from front to rear.

You may also choose to apply only two channels of input to deliver signal to all five amplifier channels. To do this, set the "**Input Mode**" switch to "**2 Ch.**" and use only the inputs to channels 1 & 2. In this mode, Channel 3 will operate with the Channel 1 signal and Channel 4 will operate with the Channel 2 signal. The amplifier will automatically combine the main input signals to mono for the Subwoofer Channel.

Input Voltage Range:

Input Voltage Range: A wide range of signal input voltages can be accommodated by the XD1000/5v2's input section (200mV – 8V). This wide range is split up into two sub-ranges, accessible via the **"Input Voltage"** switch:

"Low": for preamp level signals
"High": for speaker level signals



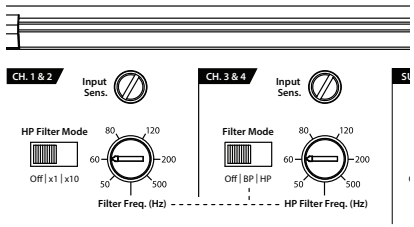
The **"Low"** position on the **"Input Voltage"** switch selects an input sensitivity range between 200mV and 2V for all input channels. This means that the **"Input Sens."** rotary control for each channel section will operate within that voltage window. If you are using an aftermarket source unit, with conventional preamp-level outputs, this is most likely the position that you will use.

The **"High"** position on the **"Input Voltage"** switch selects an input sensitivity range between 800mV and 8V for all input channels. This is useful for certain high-output preamp level signals as well as speaker-level output from source units and small amplifiers. To use speaker-level sources, splice the speaker output wires of the source unit or small amplifier onto a pair of RCA cables or plugs or use the JL Audio ECS Speaker Wire to RCA adaptor (XD-CLRAIC2-SW).

Line Output Converters are usually not needed with the XD1000/5v2. If you find that the output cannot be reduced sufficiently with a direct speaker level signal applied to the amplifier and the **"Input Voltage"** switch in its **"High"** position, you may use a "line output converter" or voltage divider to reduce the signal level.

INPUT SENSITIVITY CONTROLS

The controls labeled "**Input Sens.**" located in each channel section can be used to match the source unit's output voltage to the input stage of each channel bank for maximum clean output. Rotating the control clockwise will result in higher sensitivity (louder for a given input voltage). Rotating the control counter-clockwise will result in lower sensitivity (quieter for a given input voltage.)



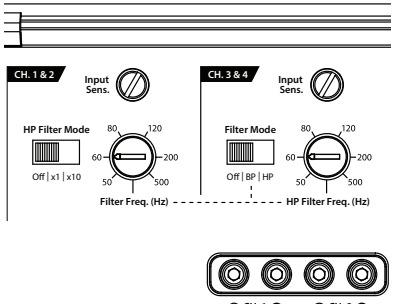
To properly set the amplifier for maximum clean output, please refer to Appendix A (page 14) in this manual. After using this procedure, you can then adjust any or all "**Input Sens.**" levels downward if this is required to achieve the desired system balance.

Do not increase any "Input Sens." setting for any channel(s) of any amplifier in the system beyond the maximum level established during the procedure outlined in Appendix A (page 14). Doing so will result in audible distortion and possible speaker damage.

FILTER CONTROLS

Most speakers are not designed to reproduce the full range of frequencies audible by the human ear. For this reason, most speaker systems are comprised of multiple speakers, each dedicated to reproducing a specific frequency range. Filters are used to select which frequency range is sent to each section of a speaker system. The division of frequency ranges to different speakers can be done with passive filters (coils and/or capacitors between the amplifier outputs and the speakers), which are acceptable and commonly used for filtering between mid-range speakers and tweeters. Filtering between subwoofer systems and satellite speaker systems is best done with active filters, which cut off frequency content at the input to the amplifier. Active filters are more stable than passive filters and do not introduce extraneous resistance, which can degrade subwoofer performance.

The active filter built into each channel section of the XD1000/5v2 can be used to eliminate potentially harmful and/or undesired frequencies from making their way through the amplifier sections to the speaker(s). This serves to improve tonal balance and to avoid distortion and possible speaker failure. Correct use of these filters can substantially increase the longevity and fidelity of your audio system.



1) **"Filter Mode" Controls**: The XD1000/5v2 employs 12dB per octave filters for each pair of main channels (one high-pass filter for channels 1&2 and another high-pass / bandpass filter for channels 3&4. The Subwoofer Channel provides a low-pass filter with the option of 12dB or 24dB / octave slopes. Each of these filters can be controlled or defeated completely by way of the three-position **"Filter Mode"** switches in each Channel Section:

Channel 1 & 2 Filter: 12dB/octave High-Pass only, with x10 multiplier switch

"Off": Defeats the filter completely, allowing the full range of frequencies present at the inputs to feed these channels. This is useful for systems utilizing outboard active crossovers or requiring full-range reproduction from this channel pair.

"x1" (High-Pass): Configures the filter to attenuate frequencies below the indicated filter frequency at a rate of 12dB per octave. This is useful for connection of component speakers or coaxials to this channel pair in a bi-amplified system.

"x10" (High-Pass): Configures the filter to attenuate frequencies below a frequency **TEN TIMES HIGHER** than the indicated filter frequency, at a rate of 12dB per octave. This is useful for connection of tweeters to this channel pair in a tri-amplified system.

Channel 3 & 4 Filter: 12dB/octave High-Pass or Bandpass Filter

"Off": Defeats the filter completely, allowing the full range of frequencies present at the inputs to feed these channels. This is useful for systems utilizing outboard active crossovers or requiring full-range reproduction from this channel pair.

"BP" (High-Pass): Configures the filter to attenuate frequencies below the indicated filter frequency AND above the Channel 1 & 2 Filter Frequency, at a rate of 12dB per octave. This is useful for connection of mid-bass or mid-range speakers in a tri-amplified system.

"HP" (High-Pass): Configures the filter to attenuate frequencies below the indicated filter frequency at a rate of 12dB per octave. This is useful for connection of component speakers or coaxials to this channel pair in a bi-amplified system.

Subwoofer Channel Filter: 12dB/octave or 24dB/octave, Low-Pass only

"Off": Defeats the filter completely, allowing the full range of frequencies present at the inputs to feed this channel. This is useful for systems utilizing outboard active crossovers.

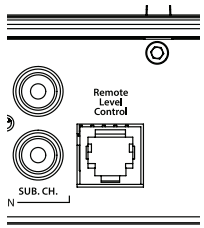
"12dB" (Low-Pass): Configures the filter to attenuate frequencies above the indicated filter frequency, at a rate of 12dB per octave. This is useful for connection of subwoofers in a bi-amplified system. This shallower slope gently attenuates high-frequencies from your subwoofer signal and is often well-suited for sedans and coupes with trunks.

"24dB" (Low-Pass): Configures the filter to attenuate frequencies above the indicated filter frequency, at a rate of 24dB per octave. This is useful for connection of subwoofers in a bi-amplified system. This sharper slope more aggressively removes high-frequencies from your subwoofer signal and is often well-suited for SUV's, wagons and hatchbacks.

2) "Filter Freq. (Hz)" The filter frequency markings surrounding these rotary controls (one in each Channel Section) are for reference purposes and are generally accurate to within 1/3 octave or better. If you would like to select the filter cutoff frequency with a higher level of precision, consult the chart in Appendix B (page 15).

Tuning Hint: If you are using the XD1000/5v2 to drive a subwoofer system ("**LP**" **mode**), and component satellite speaker systems ("**HP**" **mode**), 80 Hz is a good baseline "**Filter Freq. (Hz)**" setting. After properly adjusting the "**Input Sens.**", as outlined in Appendix A (page 14), you can fine tune the "**Filter Freq. (Hz)**" control to achieve the desired system frequency response.

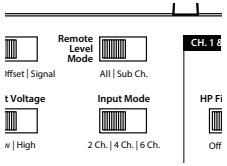
REMOTE LEVEL CONTROL (OPTIONAL)



With the addition of the optional Remote Level Control (HD-RLC), you can control the volume of the subwoofer channel (Subwoofer Level) or of the entire XD1000/5v2 from the front of the vehicle (Master Volume).

The HD-RLC connects to the jack labeled "Remote Level Control" on the Connection Panel of the amplifier using a standard telephone cable (supplied with the HD-RLC). If desired, multiple XD (and HD) amplifiers can be controlled from a single HD-RLC controller using a simple non-duplex, single line, phone cable "splitter" and multiple phone cables.

When connected to the amplifier, the HD-RLC operates as follows. At full counter-clockwise rotation, the audio of the selected channels will mute completely. At full clockwise rotation the level will be the same as if the HD-RLC was not connected at all. In other words, it operates strictly as a level **attenuator.**



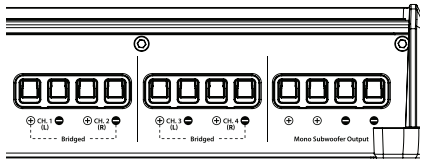
"Remote Level Mode" Switch: This switch allows you to assign the operation of the HD-RLC to the entire amplifier or only the subwoofer channel. In the **"All"** position, the HD-RLC knob will affect all channels equally. In the **"Sub Ch."** position, only the level of the subwoofer channel will be affected by the HD-RLC knob.

ENGLISH

SPEAKER OUTPUTS

The XD1000/5v2's speaker outputs are designed to accept 16 AWG - 8 AWG wire. To connect the speaker wires to the amplifier, first back out the set screws on the top of the terminal block, using the supplied 2.5 mm hex wrench. Strip 1/2 inch (12 mm) of insulation from the end of each wire and insert the bare wire into the terminal block, seating it firmly so that no bare wire is exposed. While holding the wire in place, tighten the set screw firmly, taking care not to strip the head of the screw.

Each pair of the XD1000/5v2's main channels are designed to deliver power into speaker loads equal to or greater than 2 ohms when using a "stereo" configuration and speaker loads equal to or greater than 4 ohms when using a "bridged" configuration. The subwoofer channel is designed to deliver power into subwoofer loads equal to or greater than 2 ohms.



! IMPORTANT

Speaker loads below 2 ohms nominal per channel (or 4 ohms bridged) are not recommended and may cause the amplifier to initiate a protection mode which reduces power output.

BRIDGING CONSIDERATIONS

Bridging is the practice of combining the output of two amplifier channels to drive a single load. When bridged, each channel produces signals of equal magnitude, but opposite polarity. The combined output of the two channels provides twice the output voltage available from a single channel. The XD1000/5v2 has been designed for bridging of its main channel pairs without the need for input inversion adaptors.

To bridge a pair of main channels, use the "**Left +**" and "**Right –**" speaker connectors only (the "**Left –**" and "**Right +**" remain unused). Each bridged channel pair will deliver optimum power into a 4 ohm load.

! IMPORTANT

When a pair of the XD1000/5v2's main channels are bridged, they will deliver 200W x 1 into a 4 ohm load or 150W x 1 into an 8 ohm load. Operating a pair of bridged channels into a load lower than 4 ohms is not recommended.

! IMPORTANT

A bridged pair of channels requires that both channels in the pair receive input. You must connect the mono or stereo source signal to both the left and right inputs of the bridged channel pair. Connection of only one input will result in reduced power output, increased distortion and can cause the amplifier to overheat. Do not do this!

When a pair of the XD1000/5v2's main channels are operating in bridged mode, the output will be in mono (only one channel). This mono channel can contain only right channel information, only left channel information, or the sum of the signals from right and left input channels. In order to achieve one of these options, configure the inputs to that pair of channels in one of these two ways:

1) **Left Channel Only or Right Channel Only Information:** If you wish to send a left-only or right-only signal to a pair of the XD1000/5v2's channels **you must use a "Y-Adaptor" to split the single channel signal into both left and right RCA inputs of the bridged channel pair.** This option is used when deploying a pair of the XD1000/5v2's main channels to drive left channel speakers only and the other pair of the XD1000/5v2's main channels to drive right channel speakers only.

2) **Left + Right Channel Information:** When bridged and fed by a stereo source signal, a bridged pair of the XD1000/5v2's channels will automatically combine the left and right input signals into a summed mono (left + right) input signal.

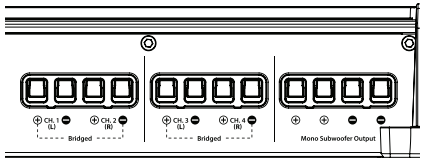
SUBWOOFER OUTPUTS

The XD1000/5v2's single subwoofer channel is designed to deliver power into subwoofer loads equal to or greater than 2 ohms. It is rated for 600W into 2 ohms, 500W into 3 ohms and 400W into 4 ohms (Continuous Power, RMS Method).

! IMPORTANT

Subwoofer loads below 2 ohms nominal are not recommended and may cause the amplifier to initiate a protection mode which reduces power output.

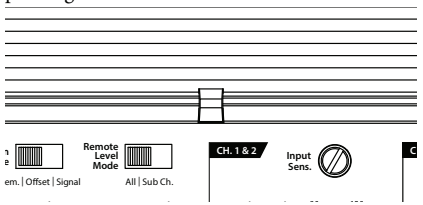
The XD1000/5v2's subwoofer outputs are designed to accept 16 AWG - 8 AWG wire. To connect the subwoofer wires to the amplifier, first back out the set screws on the top of the terminal block, using the supplied 2.5 mm hex wrench. Strip 1/2 inch (12 mm) of insulation from the end of each wire and insert the bare wire into the terminal block, seating it firmly so that no bare wire is exposed. While holding the wire in place, tighten the set screw firmly, taking care not to strip the head of the screw.



You will notice that there are two "+" positive connections and two "–" negative connections. This is to facilitate multiple subwoofer wiring. **The two positive and two negative connections are connected in parallel inside the amplifier They are not stereo outputs.** Connecting two subwoofers, each to one set of positive and negative terminals, will result in a parallel subwoofer connection. If only connecting one pair of subwoofer wires, it is not necessary to use both sets of connections.

STATUS LED / PROTECTION CIRCUITRY

There is a single multi-color LED on the top surface of the amplifier to indicate the amplifier's operating status.



1) Flashing Green: amplifier is powering up, audio output is muted.

2) Constant Green: amplifier is on and functioning normally, audio output is active.

3) Constant Red: Indicates that the amplifier has exceeded its safe operating temperature, putting the amplifier into a self-protection mode, which reduces the peak power output of the amplifier. When its temperature returns to a safe level, the red light will return to green and the amplifier will return to full-power operating mode.

4) Constant Amber (yellow): Indicates that an over-current condition has occurred and is accompanied by a muting of the affected channel(s). Because the muting behavior may be very short in duration, it may manifest itself as an audible, repetitive ticking noise in the output. Over-current conditions can be caused by a speaker impedance lower than the optimum load impedance range for the amplifier or a short-circuit in the speaker wiring. The latter can result from a short circuit between the positive and negative speaker wires or between either speaker wire and the vehicle chassis. The **"Status LED"** will remain amber for a few seconds, even if the over-current condition is of a very short duration. This functionality can be used to diagnose a short-circuit by only connecting one channel at a time. The **"Status LED"** will turn amber when you connect the channel that is experiencing the problem and turn the volume up.

5) LED off / Amplifier Shuts Off Unexpectedly
The only condition that will shut down an undamaged XD1000/5v2 completely is if battery voltage or remote turn-on voltage drops below 10 volts. The **"Status LED"** will turn off when this occurs. The amplifier will turn back on when voltage climbs back above 11 volts. If this is happening in your system, have your charging system and power wiring inspected.

SYSTEM CONFIGURATIONS

The XD1000/5v2 is a very flexible amplifier, well-suited for a multitude of system configurations. In this section, the most likely configurations for a system with a single XD1000/5v2 are explained in detail.

Once you have selected your desired configuration, you can use the amplifier panel drawing on pages 18 & 19 to mark the required switch positions for easy reference.

BI-AMPLIFIED SYSTEMS

Bi-amplified systems are defined as systems in which separate amplifier channels drive low-frequency (LF) and high-frequency (HF) speakers and are separately filtered to send appropriate frequency ranges to each speaker system.

The most common application of bi-amplification in mobile audio is to drive a subwoofer system from one or more amplifiers or channels and component speakers from separate amplifiers or channels.

The XD1000/5v2 can be configured to drive a bi-amplified system by itself.

Bi-Amplified System with one XD1000/5v2

In this configuration, the Subwoofer Channel of the XD1000/5v2 will drive a subwoofer system with low-pass filtering. The Main Channels (1&2, 3&4) will drive component speakers in stereo with high-pass filtering.

Crossover Setup for Bi-Amplified System with one XD1000/5v2:

Once the input sections have been configured appropriately (see page 6), go to the "**SUB CH.**" control section and select "**12dB**" or **"24dB"** (low-pass) on the "**LP Filter Mode**" switch and an appropriate "**Filter Freq.**" (80 Hz is a good starting point). The **"12dB"** setting engages a shallow filter slope that gradually attenuates frequencies above the selected **"Filter Freq."** setting. The **"24dB"** setting engages a sharper filter slope that more aggressively attenuates frequencies above the selected **"Filter Freq."** setting. Neither setting is "better", but in general, the shallower **"12dB"** setting is more desirable for a subwoofer having to fire from a trunk into the cabin of a sedan or coupe. The sharper **"24dB"** setting is typically better in a hatchback, SUV or wagon application. Experiment to find the slope setting that results in the smoothest subwoofer to midbass transition.

Next, turn your attention to the "**CH 1 & 2**" Controls and select "**x1**" (high-pass) on the **"HP Filter Mode**" switch and select an appropriate "**Filter Freq.**" (again, 80 Hz is a good starting point). The **"x1"** setting means that the Filter Freq. indicated on the dial is exactly what you are selecting. (In the **"x10"** mode, the actual Filter Frequency is ten times higher than the indicated value. This setting is generally not used in bi-amplified systems.)

Finally, turn your attention to the "**CH 3 & 4**" Controls and select "**HP**" (high-pass) on the **"Filter Mode**" switch and select an appropriate "**Filter Freq.**" (again, 80 Hz is a good starting point).

Tri-Amplified Systems with one XD1000/5v2

The XD1000/5v2's 3-way crossover capability allows you to create true, tri-amplified systems by selecting the appropriate settings described below.

In a tri-amplified configuration, the Subwoofer Channel of the XD1000/5v2 will drive a subwoofer system, in mono, with low-pass filtering. Channels 3 & 4 will drive component woofers (or mid-range speakers) in stereo with bandpass filtering (both a high-pass and a low-pass filter applied). Channels 1 & 2 will drive high-frequency speakers (tweeters, typically), in stereo, with high-pass filtering.

! IMPORTANT

To operate a single XD1000/5v2 in Tri-Amplified mode, set the **"Input Mode"** switch in **"2 Ch."** mode, and apply a single set of stereo inputs to the Ch. 1 & 2 Inputs only!

Crossover Setup for Tri-Amplified System with one XD1000/5v2:

First go to the "**SUB CH."** control section and select "**12dB**" or **"24dB"** (low-pass) on the "**LP Filter Mode**" switch and an appropriate "**Filter Freq.**" (80 Hz is a good starting point). The **"12dB"** setting engages a shallow filter slope that gradually attenuates frequencies above the selected **"Filter Freq."** setting. The **"24dB"** setting engages a sharper filter slope that more aggressively attenuates frequencies above the selected **"Filter Freq."** setting. Neither setting is inherently "better", but in general, the shallower **"12dB"** setting is more desirable for a subwoofer having to fire from a trunk into the cabin of a sedan or coupe. The sharper **"24dB"** setting is typically better in a hatchback, SUV or wagon application. Experiment to find the slope setting that results in the smoothest subwoofer to midbass transition.

Next, turn your attention to the "**CH 3 & 4**" Controls and select "**BP**" (bandpass) on the **"Filter Mode**" switch. A bandpass filter is actually composed of two filters (one high-pass and one low-pass), which in combination allow a defined "band" of frequencies to pass through the amplifier channels and on to the speakers. These are ideal for actively filtered mid-bass or mid-range speakers in automotive sound systems.

Now that you have engaged Bandpass Mode for Channels 3 & 4, select an appropriate "**Filter Freq.**" (again, 80 Hz is a good starting point). The Filter Frequency you are adjusting with this control is the high-pass portion of the bandpass filter. The low-pass portion is automatically set by the tweeter channel's **"Filter Freq."** adjustment (CH 1 & 2). The low-pass portion of the bandpass filter will always track with the CH 1 & 2 **"Filter Freq."** setting.

Finally, turn your attention to the "**CH 1 & 2**" Controls and select "**x10**" (high-pass) on the **"HP Filter Mode**" switch. This switch position multiplies the indicated **"Filter Freq."** value by a factor of 10, so that an indicated frequency of 500 Hz is actually a filter frequency of 5000 Hz (5 kHz). The filter slope for this section is fixed at 12dB/octave.

Now, select an appropriate "**Filter Freq.**" for your tweeters (5000 Hz is a good starting point). Before attempting any lower frequency settings, consult the documentation for the tweeters you are using and make sure you will not be driving the tweeters with frequencies lower than they are designed to handle. JL Audio mobile component tweeters should not be operated with Filter Frequencies lower than 3 kHz.

After proper adjustment of the "**Input Sens.**" controls for both main channel pairs and the subwoofer channel using the method shown in Appendix A (page 14), you can fine tune filter frequencies and attenuate either pair of channels to achieve proper balance. For precise filter frequency information refer to Appendix B (page 15)

! IMPORTANT

To operate two XD1000/5v2's in Tri-Amplified mode (one for left channel and the other for right channel), set the **"Input Mode"** switches of both amplifiers in **"2 Ch."** mode, and apply the left channel signal to both the left and right inputs of the first amplifier's Channel 1 & 2 Inputs, using an RCA y-adaptor with one female and two male ends. Then apply the right channel signal to both the left and right inputs of the second amplifier's Channel 1 & 2 inputs, using a second RCA y-adaptor with one female and two male ends.

SERVICING YOUR JL AUDIO AMPLIFIER

If your amplifier fails or malfunctions, please return it to your authorized JL Audio dealer so that it may be sent in to JL Audio for service. There are no user serviceable parts or fuses inside the amplifier. The unique nature of the circuitry in the JL Audio amplifiers requires specifically trained service personnel. Do not attempt to service the amplifier yourself or through unauthorized repair facilities. This will not only void the warranty, but may result in the creation of more problems within the amplifier.

If you have any questions about the installation or setup of the amplifier not covered in this manual, please contact your dealer or technical support.

JL Audio Technical Support:
(954) 443-1100
9:00 AM – 5:30 PM (Eastern Time Zone)
Monday - Friday

APPENDIX A:
Input Sensitivity Level Setting

Following the directions below will allow the installer to adjust the input sensitivity of each amplifier channel pair simply and easily in just a few minutes using equipment which is commonly available in installation bays.

Necessary Equipment

- Digital AC Voltmeter
- CD with a sine-wave test tone recorded at 0 dB reference level in the frequency range to be amplified for that set of channels (50 Hz for subwoofer channels, 1 kHz for a midrange application). Do not use attenuated test tones (-10 dB, -20 dB, etc.).

The Nine-Step Procedure

1) Disconnect the speaker(s) from the amplifier's speaker output connectors.
2) Turn off all processing (bass/treble, loudness, EQ, etc.) on the source unit, processors (if used) and amplifier. Set fader control to center position and subwoofer level control to 3/4 of maximum (if used to feed the XD1000/5v2).
3) Turn all three "**Input Sens.**" controls all the way down.
4) Set the source unit volume to 3/4 of full volume. This will allow for reasonable gain overlap with moderate clipping at full volume.
5) Using the chart on this page, determine the target voltage for input sensitivity adjustment according to the nominal impedance of the speaker system connected to the amplifier outputs.
6) Verify that you have disconnected the speakers before proceeding. Play a track with an appropriate sine wave (within the frequency range to be amplified by the channel you are adjusting) at 3/4 source unit volume.
7) Connect the AC voltmeter to the speaker output connectors of the amplifier. If the channel pair is operating in stereo, it is only necessary to measure one channel. If bridged, make sure you test the voltage at the correct connectors (L+ and R–).
8) Increase the **"Input Sens."** control until the target voltage is observed with the voltmeter.
9) Once you have adjusted each channel sectio of the XD1000/5v2 to its maximum low-distortion output level, reconnect the speaker(s). The **"Input Sens."** controls can now be adjusted downward if the amplifier requires attenuation to achieve the desired system balance.

! IMPORTANT

Do not increase any "Input Sens." setting for any amplifier channel or channel pair in the system beyond the maximum level established during this procedure. Doing so will result in audible distortion and possible speaker damage.

It will be necessary to readjust the **"Input Sens."** for the affected channels if any equalizer boost is activated after setting the **"Input Sens."** with this procedure. This applies to any EQ boost circuit, including source unit tone controls or EQ circuits. EQ cuts will not require re-adjustment.

Nom. Impedance	Target AC Voltage		
	Main CH (Stereo)	Main CH (Bridged)	Subwoofer CH
8Ω	17.3 V	34.6 V	40.0 V
6Ω	17.3 V	32.4 V	40.0 V
4Ω	17.3 V	28.3 V	40.0 V
3Ω	16.2 V	not recommended	38.7 V
2Ω	14.1 V	not recommended	34.6 V

APPENDIX B:
Precise Frequency Selection Chart

Detent Number	"FILTER FREQ" Panel Marking	Actual Freq.
Full counter-clockwise:		**49**
01		49
02	"50"	49
03		50
04		50
05		52
06		53
07		55
08	"60"	57
09		59
10		61
11		63
12		65
13		68
14		70
15		73
16	"80"	76
17		79
18		83
19		86
20	"12 o'clock"	90
21		95
22		100
23		105
24	"120"	111
25		118
26		126
27		135
28		146
29		160
30		174
31		192
32	"200"	217
33		243
34		286
35		339
36		406
37		444
38	"500"	482
39		483
Full-clockwise:		**483**

Due to ongoing product development, all specifications are subject to change without notice.

APPENDIX C:
XD1000/5v2 Specifications:

Recommended Fuse Value: 80A
Recommended Fuse Type: MAXI® or AGU

Input Sections:

No. of Inputs: Three Stereo Pairs
Input Type: Differential-balanced with RCA jack inputs
Input Range: 100mV - 8V RMS

Amplifier Section:

Amplifier Topology: NexD™ Ultra-High Speed Class D
Power Supply: Unregulated MOSFET switching type
Rated Power at 14.4V with less than 1% THD+Noise (20Hz - 20 kHz), RMS Method
Main Channels, Stereo, all channels driven:
75W x 4 @ 4 ohms, 100W x 4 @ 2 ohms
Main Channels, Bridged, all channels driven:
150W x 2 @ 8 ohms, 200W x 2 @ 4 ohms
Subwoofer Channel, Mono, all channels driven:
400W x 1 @ 4 ohms, 500W x 1 @ 3 ohms, 600W x 1 @ 2 ohms
Rated Power @ 12.5V with less than 1% THD + Noise (20Hz - 20 kHz), RMS Method
Stereo, all channels driven:
60W x 4 @ 4 ohms, 90W x 4 @ 2 ohms
Rated Power Bridged, all channels driven:
120W x 2 @ 8 ohms, 180W x 2 @ 4 ohms
Subwoofer Channel, Mono, all channels driven:
360W x 1 @ 4 ohms, 480W x 1 @ 3 ohms, 600W x 1 @ 2 ohms
S/N Ratio (A-weighted, 20 Hz-20 kHz noise bandwidth):
Main Channels: >104 dB referred to rated power, >84 dB referred to 1W
Subwoofer Channel: >100dB referred to rated power, >80dB referred to 1W
Frequency Response:
Main Channels: 12 Hz - 22 kHz (+0, -1dB)
Subwoofer Channel: 10 Hz - 1 kHz (+0, -1dB)
Damping Factor:
Main Channels: >150 @ 4 ohms per ch./ 50 Hz, >75 @ 2 ohms per ch. / 50 Hz
Subwoofer Channel: >150 @ 4 ohms per ch./ 50 Hz, >75 @ 2 ohms per ch. / 50 Hz

Crossover Filters:

Filter Type: State-variable / Sallen-Key, with continuously variable cutoff frequency selection, defeatable
Ch 1&2: 12dB/oct. High-Pass (50-500 Hz, switchable to 500-5000 Hz via"x10" switch)
Ch. 3&4: 12dB/oct. High-Pass (50-500 Hz) or Bandpass (uses Ch 1&2 Filter Frequency as Low-Pass cutoff)
Sub Ch: 12dB or 24dB/oct. Low-Pass (50-500 Hz)

Dimensions (LxWxH):

14.73"x 7.09" x 2.05" (374mm x 180mm x 52mm)

ENGLISH

APPENDIX D: TROUBLESHOOTING

"How do I properly set the input sensitivity on my amplifier?"

Please refer to Appendix A (page 14) to set the input sensitivity for maximum, low-distortion output.

"My amplifier doesn't turn on."

Check the fuse, not just visually, but with a continuity meter. It is possible for a fuse to have poor internal connections that cannot be found by visual inspection. It is best to take the fuse out of the holder for testing. If no problem is found with the fuse, inspect the fuse-holder.

Check the integrity of the connections made to each of the "**+12VDC**", "**Ground**", and "**Remote**" terminals. Ensure that no wire insulation is pinched by the terminal set screw and that each connection is tight.

Check to make sure there is +12V at the **"Remote"** connection of the amplifier. In some cases, the turn-on lead from the source unit is insufficient to turn on multiple devices and the use of a relay is required. To test for this problem, jump the "**+12VDC**" wire to the "**Remote**" terminal to see if the amplifier turns on.

"I get a repetitive ticking or popping sound coming out of the speaker(s)."

Check the speaker wires for a possible short, either between the positive and negative leads or between either speaker lead and the vehicle's chassis ground. If a short is present, you will experience distorted and/or attenuated output. The "**Status LED"** will turn Amber (yellow) in this situation. It may be helpful to disconnect the speaker wires from the amplifier and use a different set of wires connected to a test speaker.

Check the nominal load impedance to verify that each channel of the amplifier is driving a load equal to or greater than 2 ohms in stereo mode (4 ohms bridged).

"My amplifier's output fluctuates when I tap on it or hit a bump."

Check the connections to the amplifier. Make sure that the insulation for all wires has been stripped back far enough to allow a good contact area inside the terminal block.

Check the input connectors to ensure that they all are making good contact with the input jacks on the amplifier.

"My amplifier shuts off once in a while, usually at higher volumes."

Check your voltage source and grounding point. The power supply of the XD1000/5v2 will operate with charging system voltages down to 10V. Shutdown problems at higher volume levels can occur when the charging system voltage (or remote turn-on voltage) momentarily drops below 10V. These dips can be of very short duration making them extremely difficult to detect with a common DC voltmeter. To ensure proper voltage, inspect all wiring and termination points. It may also be necessary to upgrade the ground wire connecting the battery to the vehicle's chassis and the power wire connecting the alternator to the battery. Many vehicles employ small (10 AWG - 6 AWG) wire to ground the battery to the vehicle's chassis and to connect the alternator to the battery. To prevent voltage drops, these wires should be upgraded to 4 AWG when installing amplifier systems with main fuse ratings above 60A. Grounding problems are the leading cause of misdiagnosed amplifier "failures."

"My amplifier turns on, but there is no output."

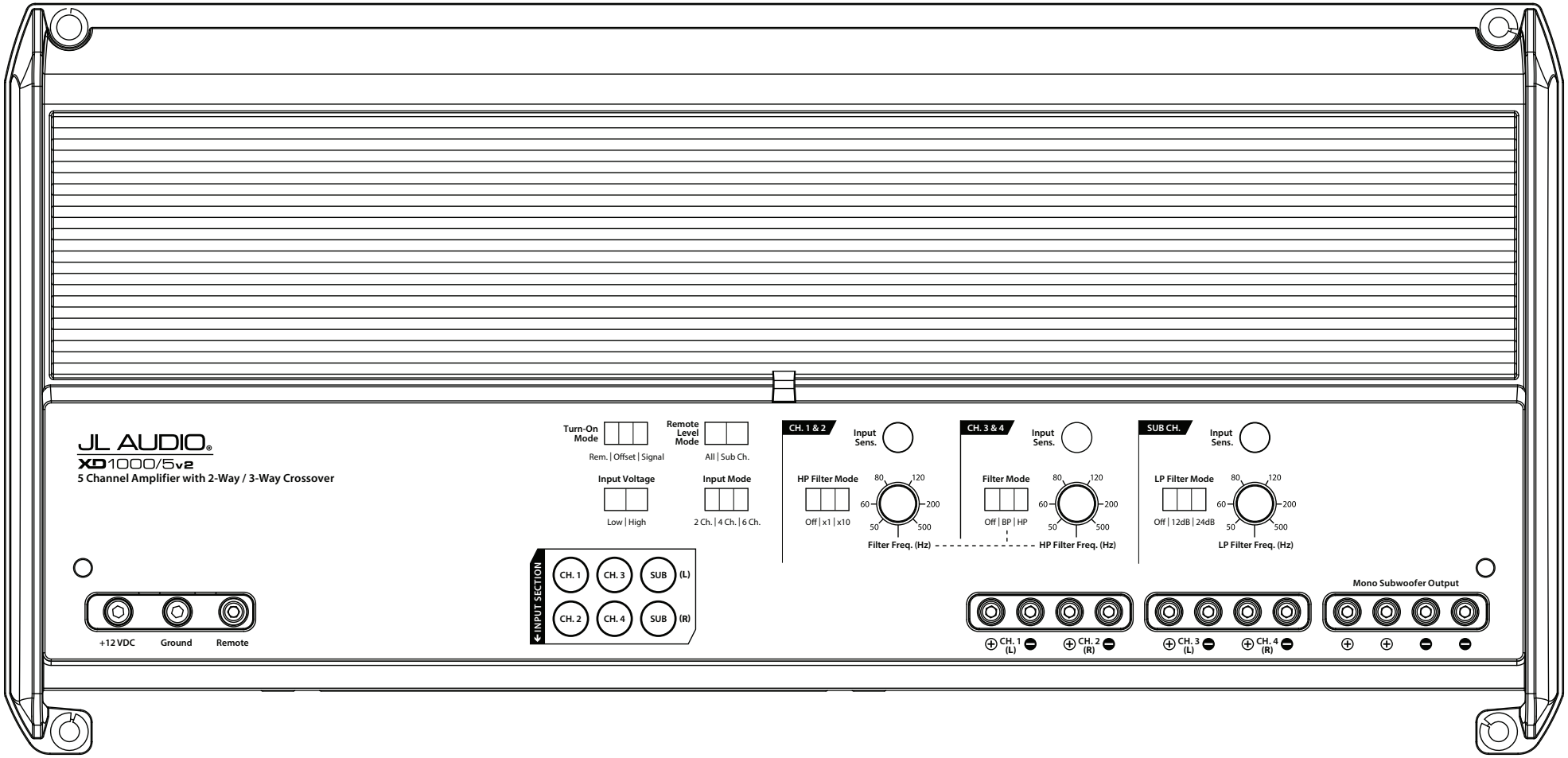
Check the input signal using an AC voltmeter to measure the voltage from the source unit while an appropriate test tone is played through the source unit (disconnect the input cables from the amplifier prior to this test). The frequency used should be in the range that is to be amplified by the amplifier (example: 50 Hz for a sub bass application or 1 kHz for a full range / high-pass application). A steady, sufficient voltage (between 0.1 and 8.0-volts) should be present at the output of the signal cables.

Check the output of the amplifier. Using the procedure explained in the previous check item (after plugging the input cables back into the amplifier) test for output at the speaker outputs of the amplifier. Remove the speaker wires from the amplifier while doing this to prevent unpleasant noise and possible speaker damage. Turn the volume up approximately half way. 5V AC or more should be measured at the speaker outputs. This output level can vary greatly between amplifiers but it should not be in the millivolt range with the source unit at half volume. If you are reading sufficient voltage, check your speaker connections as explained below.

Check to ensure that the speaker wires are making a good connection with the metal inside the terminal block. The speaker wire connectors are designed to accept up to 8 AWG wire. Make sure to strip the wire to allow for a sufficient connection with the metal inside the terminal block.

INSTALLATION NOTES:

Use this diagram to document your amplifier's switch and control positions.



LIMITED WARRANTY - AMPLIFIERS (USA)

JL AUDIO warrants this product to be free of defects in materials and workmanship for a period of two (2) years. The warranty is extended to three (3) years total if installation is performed by an authorized JL Audio dealer using a JL Audio Premium Power Connection System for power wiring.

This warranty is not transferrable and applies only to the original purchaser from an authorized JL AUDIO dealer. Should service be necessary under this warranty for any reason due to manufacturing defect or malfunction, JL AUDIO will (at its discretion), repair or replace the defective product with new or remanufactured product at no charge. Damage caused by the following is not covered under warranty: accident, misuse, abuse, product modification or neglect, failure to follow installation instructions, unauthorized repair attempts, misrepresentations by the seller. This warranty does not cover incidental or consequential damages and does not cover the cost of removing or reinstalling the unit(s). Cosmetic damage due to accident or normal wear and tear is not covered under warranty.

Warranty is void if the product's serial number has been removed or defaced.

Any applicable implied warranties are limited in duration to the period of the express warranty as provided herein beginning with the date of the original purchase at retail, and no warranties, whether express or implied, shall apply to this product thereafter. Some states do not allow limitations on implied warranties, therefore these exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

If you need service on your JL AUDIO product:

All warranty returns should be sent to JL AUDIO 's Amplifier Service Facility freight-prepaid through an authorized JL AUDIO dealer and must be accompanied by proof of purchase (a copy of the original sales receipt). Direct returns from consumers or non-authorized dealers will be refused unless specifically authorized by JL AUDIO with a valid return authorization number.

Warranty expiration on products returned without proof of purchase will be determined from the manufacturing date code. Coverage may be invalidated as this date is previous to purchase date. Non-defective items received will be returned freight-collect. Customer is responsible for shipping charges and insurance in sending the product to JL AUDIO. Freight damage on returns is not covered under warranty.

For Service Information in the U.S.A. please call
JL Audio Customer Service: (954) 443-1100
9:00 AM – 5:30 PM (Eastern Time Zone)
JL Audio, Inc
10369 North Commerce Pkwy.
Miramar, FL 33025
(do not send product for repair to this address)

International Warranties:
Products purchased outside the United States of America are covered only by that country's distributor and not by JL Audio, Inc.